

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 09/824,570 Confirmation No. : 8702
First Named Inventor : Christof EBERSPAECHER
Filed : April 3, 2001
C/A.U. : 1775
Examiner : JASON L. SAVAGE
Docket No. : 225/49834
Customer No. : 23911

Title : Synchronizer Ring

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

By way of a Notice of Appeal filed on March 30, 2005, Appellants are appealing to the Board of Patent Appeals and Interferences from the final rejection of claims 1, 2, 4, 16, and 56-59. The following is the Appeal Brief submitted pursuant to 37 C.F.R. § 41.37.

REAL PARTIES IN INTEREST

The real parties in interest are DaimlerChrysler AG of Eppelstrasse 225, 70567 Stuttgart, Germany, and Drahtwarenfabrik Drahtzug Stein GmbH & Co. KG, D-67317 Altleiningen Drahtzug, Germany, by way of an Assignment recorded in the U.S. Patent and Trademark Office Assignment records at Reel 012054, Frame 0591.

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RELATED APPEALS AND INTERFERENCES

No interferences, judicial proceedings, or other appeals which are related to, directly affect, are directly affected by, or have a bearing on a decision in the present appeal are known.

STATUS OF CLAIMS

Claims 1, 2, 4, 16, and 56-59 are present in the application, are rejected, and are appealed. Claims 3, 5-15, and 17-55 are canceled.

STATUS OF AMENDMENTS

No amendments subsequent to the final rejection set forth in the Office Action dated December 30, 2004, have been filed.

SUMMARY OF CLAIMED SUBJECT MATTER

A concise explanation of the subject matter defined in independent claim 1, the only independent claim involved in the appeal, and in certain dependent claims will now be provided. This explanation refers, by way of example only and without intending to limit the claims, to certain drawing figures and to paragraph and line numbers of the specification.

One embodiment of the invention, shown in Figures 1-2, includes a synchronizer ring including a ring body 2 which has a sliding region, and a wear-resistant tribological coating 4 with which the sliding region is provided (see, for example, lines 1-6 of paragraph 0024). The tribological coating 4 is thermally

sprayed so as to produce oil displacement channels by way of a porous microstructure produced without machining (see, for example, lines 7-11 of paragraph 0007). As noted, for example, in lines 1-3 of paragraph 0007, lines 1-4 of paragraph 0008, lines 1-3 of paragraph 0014, and lines 1-3 of paragraph 0025, the tribological coating 4 is permitted to be over 30% and up to 40% by weight of a solid lubricant.

The solid lubricant preferably has a particle size of no more than approximately 180 μm , as discussed, for example, in lines 1-3 of paragraph 0009 and lines 2-5 of paragraph 0027, and the thermally sprayed coating 4 preferably has a porosity of up to approximately 30%, as discussed, for example, in lines 8-10 of paragraph 0025. As noted, for example, in lines 3-7 of paragraph 0007, and lines 1-4 of paragraph 0012, the solid lubricant is preferably selected from the group consisting of titanium dioxide (TiO_2), calcium fluoride (CaF_2), hexagonal boron nitride (h-BN), graphite, lead (Pb), and molybdenum sulphide (MoS_2). The thermally sprayed coating furthermore contains at least one material selected from the group consisting of tin, zinc, silicon, nickel, manganese, copper, aluminum, one or more of their oxides, one or more of their carbides, one or more of their nitrides and carbon (see, for example, lines 3-8 of paragraphs 0009 and 0025).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The sole ground of rejection presented for review in this appeal is whether claims 1, 2, 4, 16, and 56-59 are unpatentable over U.S. Patent 5,249,661 to Kawamura et al.

ARGUMENT

The rejection of independent claim 1 under 35 U.S.C. § 103(a) based on the Kawamura et al. patent is erroneous and should be reversed. The Kawamura et al. patent does not disclose or suggest a synchronizer ring comprising a tribological coating which is permitted to be over 30% and up to 40% by weight of a solid lubricant as claim 1 requires. The film 3 of the Kawamura et al. synchronizer ring, instead, has ceramic particles of 5 to 30% by weight disposed in molybdenum or a molybdenum alloy. Lines 30-35 in column 4 of the Kawamura et al. patent set forth that when the ceramic particles are present in an amount over 30 weight %, abrasion of the object member may overexceed. Evaluating the disclosure provided by the Kawamura et al. patent for what it fairly teaches one of ordinary skill in the art necessarily leads to a conclusion that a synchronizer ring comprising a tribological coating which is permitted to be up to 40% by weight of a solid lubricant is not to be provided, since such a coating would provide abrasion which may overexceed. In view of the discussion provided by lines 30-35 in column 4 of the Kawamura et al. patent, modifying the Kawamura et al. film 3 so that it is permitted to be over 30% and up to 40% by weight of a solid lubricant as claim 1 requires certainly is not made obvious by

the Kawamura et al. patent disclosure itself. Such a modification is also not suggested by anything else properly relied on by the Examiner.

In lines 1-3 of the first full paragraph on page 3 of the Office Action dated December 30, 2004, the Examiner refers to lines 51-60 in column 4 of the Kawamura et al. patent, and contends that this portion of the Kawamura et al. patent “teaches that the loading may be 30 wt%.” This is not correct, however, since lines 51-60 in column 4 of the Kawamura et al. patent discuss surface porosity percentage rather than weight percentage. The Examiner states in the first full paragraph on page 6 of the Office Action, moreover, that “even though the art discloses that having lubricants in an amount greater than 30 wt% could result in unwanted abrasion of the object member, it is still considered a teaching of solid lubricant loadings of over 30 wt%,” apparently concluding, therefore, that lines 13-15 and 30-35 in column 4 of the Kawamura et al. patent disclose the “over 30% and up to 40% by weight of a solid lubricant” range specified by claim 1. Under U.S. law, however, where there is a range disclosed in the prior art, and the claimed invention falls within that range, any presumption that the claimed invention is obvious will be rebutted if it can be shown that the prior art taught away from the claimed invention. *Iron Grip Barbell Co. v. USA Sports Inc.* 392 F.3d 1317, 1322, 73 USPQ2d 1225, 1228 (Fed. Cir. 2004). The clear teaching provided by lines 30-35 in column 4 of the Kawamura et al. patent, namely that abrasion of the object member may overexceed when ceramic particles are present in an amount over 30 weight %, serves to rebut any possible presumption that the “over 30% and up to 40% by

“weight” range specified by claim 1 of the present application is obvious in view of the Kawamura et al. patent.

Claim 1 also defines the solid lubricant as having a particle size of no more than approximately 180 μm . While it is acknowledged that the discussion set forth from line 60 in column 5 to line 2 in column 6 of the Kawamura et al. patent describes formation of a flame-coated film by effecting a coating treatment with material powders consisting of 150 mesh structure molybdenum alloy to which 250 mesh ceramic particles were added, nothing in this or any other portion of the Kawamura et al. patent suggests provision of a solid lubricant having a particle size of no more than approximately 180 μm as particularly recited in claim 1.

For the reasons discussed above, the rejection of claim 1 under 35 U.S.C. § 103(a) is erroneous and should be reversed. Claims 2, 4, 16, and 56-59 depend on claim 1, and the rejection of these claims should be reversed as well for the same reasons.

CONCLUSION

This Appeal Brief is accompanied by a check in the amount of \$500.00 in payment of the fee required pursuant to 37 C.F.R. § 41.20(b)(2). This amount is believed to be correct; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 05-1323 (Docket No. 225/49834).

June 30, 2005

Respectfully submitted

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CLAIMS APPENDIX

1. A synchronizer ring comprising:
 - a ring body which has a sliding region, and
 - a wear-resistant tribological coating with which the sliding region is provided,
 - wherein the tribological coating is thermally sprayed so as to have a porous microstructure produced without machining,
 - wherein said tribological coating is permitted to be over 30% and up to 40% by weight of a solid lubricant,
 - wherein the solid lubricant has a particle size of no more than approximately 180 μm , and
 - wherein the thermally sprayed coating has a porosity of up to approximately 30%.
2. The synchronizer ring according to Claim 1, wherein the solid lubricant is selected from the group consisting of titanium dioxide (TiO_2), calcium fluoride (CaF_2), hexagonal boron nitride (h-BN), graphite, lead (Pb) and molybdenum sulphide (MoS_2).
4. The synchronizer ring according to Claim 1, wherein the thermally sprayed coating furthermore contains at least one material selected from the group consisting of tin, zinc, silicon, nickel, manganese, copper, aluminum, one

or more of their oxides, one or more of their carbides, one or more of their nitrides and carbon.

16. The synchronizer ring according to Claim 2, wherein the thermally sprayed coating furthermore contains at least one material selected from the group consisting of tin, zinc, silicon, nickel, manganese, copper, aluminum, one or more of their oxides, one or more of their carbides, one or more of their nitrides and carbon.

56. The synchronizer ring according to Claim 1, wherein said porosity is no higher than 20%.

57. The synchronizer ring according to Claim 2, wherein said porosity is no higher than 20%.

58. The synchronizer ring according to Claim 4, wherein said porosity is no higher than 20%.

59. The synchronizer ring according to Claim 16, wherein said porosity is no higher than 20%.